Art. VIII.—*Preliminary Notice of Additions to the Extinct Avifauna of New Zealand. (Abstract.)**

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In the majority of the larger deposits of moa-bones discovered in both Islands the remains of numerous smaller birds have also been obtained. With a few exceptions these had been laid aside to wait identification and description at some future time. The chief reason for this neglect was doubtless the keener interest aroused in the scientific world in the moa, and the expectancy and the hopes, so often realised, of the explorers being able to add to the list of these giant struthioids which every new cave or swamp for many years raised; a second and very valid reason being the almost total lack in most of the museums of the colony of the necessary skeletons of recent birds of every family with which to compare these unknown subfossil remains. This latter drawback still exists to a great extent, and till a more complete series has by degrees accumulated many of the bones so discovered must remain unidentified. The acquisition of birds and the preparation of their skeletons for the purposes of this paper have been in progress for upwards of two years, and by their means and along with the avian osteological collection accumulated by him during his lengthened travels the author is able to present to the Institute to-night the first instalment of his identifications. The material on which the author bases this paper was collected from the Glenmark Swamp by Sir Julius von Haast; from the Hamilton Swamp by the Otago Museum Committee; from the Earnscleugh Cave by his late friend the Hon. Captain Fraser, by D. Thompson, and Captain Hutton; from the Moa-bone Point Cave, Sumner, by his predecessor; from the Arkle Creek deposit by himself; from the Te Aute Swamp by Mr. A. Hamilton; from Monck's Cave, Sumner, and from the Enfield Swamp, Oamaru, under the author's supervision; from Shag Valley, and in the notorious Rauparaha's Pa kitchen-middens, by Mr. A. Hamilton. For the generous use of this material the author offers his warmest thanks to the Hawke's Bay Philosophical Institute, to Professor Parker, F.R.S., Otago Museum, and especially to Mr. A. Hamilton, by whose inde-

* This paper is published in abstract, as it has been found impossible to prepare all the necessary drawings for its proper illustration in time for the present volume.

fatigable energy a great part of the collection was personally brought together. This collection of bones indicates that, besides the moas, a host of smaller birds have dropped out of the race, and remained with the years that are behind. The cause of the disappearance of so many species, to all appearance equally fitted to succeed in the struggle against extermination with many of those that have survived and are now with us, is still to seek.

The author in this paper describes twelve species new to the ancient bird-life of New Zealand. The list is headed by two harriers, *i.e.*, *Circus hamiltoni* and *Circus teauteensis*, two raptorial birds much larger than the present New Zealand harrier (*Circus gouldi*) without approaching in size or power the gigantic *Harpagornis*. From the swamps and caves of both Islands, bones referable to the genus *Notornis*, to which the apparently extinct takahe belongs, are not infrequent. The *Notornis mantelli* was founded in 1848 by Professor Owen on the skull of the bird; and in a later paper in the Transactions of the Zoological Society of London, vol. iv., part i., he describes and illustrates on pl. ii., fig. 4, a tibia of this bird, of which the length is given as 7in. 10 lines. On examining this figure carefully, the author has come to the conclusion that some mistake must have occurred, as the bone figured does certainly not present the characteristics of a Ralline tibia, especially in the outline and position of its cnemial crests and in the form of its fibular ridge. It more closely represents a swan's leg-bone. The question of the determination of the species of *Notornis* to which the bones now being discussed by the author belong depends on the correctness of Sir Richard Owen's determination of the tibia he has figured. On comparing the description with the figure of the bone there seems no discrepancy, so far as the figure allows one to judge; consequently, if he was describing a non-Ralline bone the descriptions and the dimensions given will not fit a *Notornis* tibia. Perhaps, however, the error may have been committed by the artist through inaccurate delineation, or by his drawing the tibia of some other bird instead of the rail's, when the dimensions of the *Notornis* tibia in the text must be accepted as correct. The only other record of the dimensions of a *Notornis* tibia that the author has access to is that quoted by Sir Walter Buller in his "History of New Zealand Birds," who gives (vol. ii., p. 93) the length of this bone, in a second skeleton acquired by the Otago Museum, as 6½in. The bones under description in the present paper consist of four tibiæ and three femora. Of the former, the larger measures 7·18in. as compared with Owen's 7·83in., while, of the remaining three, two measure 6·35in. as compared with the Otago Museum specimen, which is 6·25in. in

length, and one 6·90in. Of the three thigh-bones in the collection, all are shorter and considerably more slender than the corresponding bone of the Dunedin skeleton, and markedly shorter than the type figured by Sir Richard Owen, while one is larger, one smaller, and one equal to *N. hochstetteri*, Meyer. Of these thigh-bones, one was discovered along with one of the shorter leg-bones, and, though of the opposite side of the body, probably belonged to the same skeleton. Buller considers that the skin described by him in the Transactions of the New Zealand Institute, vol. xiv., belonged to a specimen "slightly larger than the type specimen;" and Meyer, of the Dresden Museum (for which the skin was purchased), considering it a new species, has named it *Notornis hochstetteri*, the original description of which is not available to the author. In Professor Parker's paper, quoted above, the length of the thigh-bone in the skeleton of this identical specimen is given as 10·3 centimetres (4·06in.). The same bone in the skeleton subsequently found is 11·2c. (4·43in.) in length, with a tibia measuring 16·3c. (6·43in.); whereas the femur of Owen's specimen is 12·4c. (4·89in.), with a tibia (as the author thinks, erroneously) 19·83c. (7·83in.) long. It follows, therefore, that Sir Walter has probably written "larger" by a *lapsus calami* instead of smaller, and that, of the bones in the present collection, three tibiæ and two femora (one of them from the Tertiary beds in Hawke's Bay, collected by Mr. Hamilton) belong to the smaller sex of *Notornis hochstetteri*, Meyer; while, if Professor Owen be incorrect in his measurements, or in the bone, the longer tibia from Te Aute will probably prove a true leg-bone of the male of *Notornis mantelli*. The former differs by 0·83c. from the length calculated for a femur of 12·40c. on the basis of the Otago Museum specimen. The femur proportionate to a tibia of 18·20c. would be 12·99c. long, on the same basis. If the professor be correct, then none of the bones in this collection belong to the type species, in which case the Otago Museum skeleton belongs to a distinct species, for which the author suggests the appellation of *Notornis parkeri*, in honour of Professor T. Jeffery Parker, F.R.S., to whom science is indebted for a valuable paper on the comparative osteology of this genus, founded on a skeleton which it was his great fortune to prepare from the fresh body of the bird, with the reverential feelings arising from the knowledge of its probably being (as time, unfortunately, seems to prove more certainly) the very last survivor of its race.

The author next describes two species of *Cnemiornis*: *C. gracilis*, a most elegantly moulded goose from the North Island; and *Cnemiornis minor*, founded on tibiæ now in the Canterbury Museum, which for many years have passed as

belonging to the long-known *calcitrans*, but which require only to be compared with the type species to disclose their distinctness.

In the collection are bones belonging probably to still another species of this remarkable genus. Sir Richard Owen early detected, in the disjointed fragments of the *Cnemiornis* skeleton, its near relationship to the unique Cape Barren goose of Australia, or *Cereopsis*. It is with much satisfaction that the author has to announce the addition to the New Zealand fauna of a species of *Cereopsis* itself. The species is founded on a portion of the cranium, which, except that it is slightly larger, is almost indistinguishable from *Cereopsis novæ-hollandiæ*. This species has been designated *Cereopsis novæ-zealandiæ*, and is important from the point of view of geographical distribution.

Equally interesting and important is the next species, as it belongs to a genus of ducks confined to Australia, and represented there by a single species, the Musk Duck, *Biziura lobata*. The present species is named *Biziura lautouri* in compliment to Dr. H. de Lautour, of Oamaru, to whom the author, as well as the Canterbury Museum, is deeply indebted for his kind aid in its acquisition of the recent important deposit of *Dinornis* remains discovered near that town.

In the present collection there is a considerable number of bones referable to Ralline birds, but for the present the author is unable to determine to what species they should be assigned, for want of the necessary skeletons to compare them with. One tibia is sufficiently distinct, however, to indicate a species of *Ocydromus* far exceeding in size any existing New Zealand form, and for it he proposes the name of *Ocydromus insignis*.

It will be within the recollection of the members that the author founded a species of swan (which he named *Chenopis sumnerensis*) on a coracoid and portion of a humerus found in Monck's Cave at Sumner. The correctness of this determination has been amply verified by the receipt of swan remains from widely-separated parts of New Zealand. Among the material referable to this group, there appears evidence of there having been probably more than one species of *Cygnus* or *Chenopis* in these Islands in ancient times—a fact of great interest also from the point of view of the geographical distribution of this disrupted family, now found living only in Europe, in South America, and in Australia. The author, not having, however, any skeletons of South American forms for purposes of comparison, is unable to decide with certainty whether the affinity of the New Zealand species is closer to the Australian species than to their Neotropical relatives.

The species next described is a shag of greater dimensions than the largest New Zealand species, *Phalacrocorax novæ-*

zealandiæ; but until more material is available the author prefers to describe it under a variety of that species, *i.e.*, *Phalacrocorax novæ-zealandiæ*, var. *major*.

The most interesting addition to the extinct avifauna of New Zealand, however, in the estimation of the author, is a group of birds belonging to the Dinornithidæ, or family of the moas, so distinct from the genus *Dinornis*, and presenting so many Casuarine characters that he has proposed a new genus, *Palæo-casuarius*, for the reception of the three species he at present considers referable to it. The genus is founded on tibiæ in his collection, very remarkable for their resemblance to those of the cassowary (*Casuarius galeatus*). These bones are at once distinguishable by their straightness, their graceful and slender contours, indicating, in contradistinction to the heavy-limbed moas, birds as fleet of foot as the emus and cassowaries. The species he has proposed to designate as—(1) *Palæo-casuarius haasti*, in memory of his predecessor, and in recognition of his great and important services to science in this colony, especially by his valuable contributions to our knowledge of the moas. This bird exceeded considerably the cassowary in size. (2) *Palæo-casuarius elegans;* and (3) *Palæo-casuarius velox*—the former of these equalling, and the latter being less than, the helmeted cassowary.

The interest of this collection consists chiefly in the evidence of a former closer connection between the avifaunas of Australia and New Zealand, exhibited by the discovery in this colony of species of swan, of musk duck, and of a true *Cereopsis*, or Cape Barren goose, and by the much closer affinity of some of the Dinornithidæ to the Struthious birds of northern Australia and of the Melanesian Islands than has hitherto been apparent.

P.S.—25th February, 1892.—A visit paid to the Chatham Islands by the author since the reading of this paper has brought to light there several highly interesting fossil and subfossil avian remains. Of these, the recovery of the Mauritian genus *Aphanapteryx* is the most important. For this species the author proposes the name of *A. hawkinsi*, in honour of the gentleman who first brought him a portion of the cranium of this bird from the islands. *Rallus dieffenbachii*, *Nestor notabilis*, and species of *Chenopis* (in very old Moriori middens), *Himantopus*, *Carpophaga*, and *Columba* are also represented among the remains from this outlying group of islands.